

16. SCHEDULE OF MITIGATION

16.1 Introduction

All mitigation measures relating to the pre-commencement, construction and operational phases of the Proposed Development are set out in the relevant chapters of the EIAR submitted as part of the planning permission application.

It is intended that the CEMP will be updated where required prior to the commencement of the development, to include all mitigations measures, conditions and or alterations to the EIAR and application documents should they emerge during the course of the planning process and would be submitted to the Planning Authority for written approval.

All mitigation measures which will be implemented during the pre-commencement, construction and operational phases of the project are outlined in Table 16-1. The mitigation measures have been grouped together according to their environmental field/topic and are presented under the following headings:

- > Construction Management
- > Drainage Design and Management
- > Peat, subsoils and bedrock
- > Population and Human Health
- > Biodiversity
- > Ornithology
- > Noise
- > Air Quality/Dust
- > Traffic
- > Cultural Heritage

The mitigation proposals in the below format provides an easy to audit list that can be reviewed and reported on during the future phases of the project. The proposal for site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as Appendix 4-4 of this EIAR. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits.

16.2

EIAR Mitigation and Monitoring Measures

Table 16-1 Schedule of Mitigation Croagh Wind Farm

EIAR Mitigation Measure (MM) Number	Reference Heading	Location	Mitigation Measure
Pre-Commencement Phase			
MM1	Environmental Management	EIAR Chapter 4	The Contractor will be responsible for implementing the mitigation measures specified throughout the EIAR and compiled in the Audit Report which is included in the CEMP. The Contractor will also be responsible for ensuring that all construction staff understand the importance of implementing the mitigation measures. The implementation of the mitigation measures will be overseen by the environmental clerk of works or supervising hydrogeologists, environmental scientists, ecologists or geotechnical engineers, depending on who is best placed to advise on the implementation. The system of auditing referred to above ensures that the mitigation measures are maintained for the duration of the construction phase, and into the operational phase where necessary.
MM2	Environmental Management	EIAR Chapter 4	The Environmental Clerk of Works will maintain responsibility for monitoring the works and Contractors/Sub-contractors from an environmental perspective. In addition, an Environmental Clerk of Works or Project Ecologist, Project Hydrologist, Project Geotechnical engineer will visit the site regularly and report to the Site Environmental Office.
MM3	Environmental Management	EIAR Chapter 4	A Site Environmental Clerk of Works will oversee the site works and implementation of the Construction Environmental Management Plan (CEMP), and provide on-site advice on the mitigation measures necessary as necessary to ensure the project proceeds as intended. The level, detail and frequency of reporting expected from the Site Environmental Clerk of Works for the

			Construction Manager, developer’s project manager, and any Authorities or other Agencies, will be agreed by parties where required prior to commencement of construction, and may be further adjusted as required during the course of the project.
MM4	Environmental Management	EIAR Chapter 4	<p>An Ecological Clerk of Works (ECoW) or Project Ecologist will be appointed. Duties will include:</p> <ul style="list-style-type: none"> ➤ Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided. ➤ Inform and educate on-site personnel of the ornithological and ecological sensitivities within the proposed development site. ➤ Oversee management of ornithological and ecological issues during the construction period and advise on ornithological issues as they arise ➤ Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. <p>Liaise with officers of consenting authorities and other relevant bodies where required with regular updates in relation to construction progress.</p>
MM5	Site Drainage Plan	EIAR Chapter 4	<ul style="list-style-type: none"> ➤ The Project Hydrologist/Design Engineer will assist in preparing a site drainage plan before construction commences.
MM6	Preparative Site Drainage Management,	EIAR Chapter 4	All materials and equipment necessary to implement the drainage mitigation measures will be brought on-site in advance of any works commencing. The drainage measures outlined in the EIS/EIAR will be installed prior to, or at the same time as the works they are intended to drain. An adequate amount of clean stone, silt fencing, stakes, etc. will be kept on site at all times to implement the drainage design measures as necessary.
MM7	Biodiversity	EIAR Chapter 6	Pre-construction surveys for Badger and Otter will be undertaken prior to the commencement of works
MM8	Biodiversity	EIAR Chapter 6	On a precautionary basis, prior to the commencement of any site works, a badger sett disturbance licence will be sought from the National Parks and Wildlife Service.

MM9	Biodiversity	EIAR Chapter 6 and Chapter 4	A detailed drainage maintenance plan for the proposed development is provided in Chapter 4 of this EIAR. This plan provides details of how water quality will be protected during the construction of the proposed development
MM10	Biodiversity	EIAR Chapter 6	The implementation of the Biodiversity Management has been provided which will ensure that any Upland blanket bog habitat that is lost to facilitate the proposed infrastructure will be replaced within the site The proposed development has the potential to result in enhancement of the surrounding areas through habitat rehabilitation management which is outlined in the Biodiversity Management Plan.
MM11	Ornithology	EIAR Chapter 7	A breeding bird survey will be undertaken between April and July. Monitoring will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey to a 500m radius of the development footprint and/or all works areas, where access allows. If breeding activity of birds of high conservation concern is identified, the nest site will be located, and earmarked for monitoring at the beginning of the first breeding season of the construction phase. If it is found to be active during the construction phase no works shall be undertaken within a 500m buffer (Forestry Commission Scotland 2006; Ruddock & Whitfield 2007) in line with best practise. No works shall be permitted within the buffer until it can be demonstrated that the nest is no longer occupied.
MM12	Traffic Management Plan, Delivery Programme, pre-commencement road works	EIAR Chapter 14	<p>A Traffic Management Plan (TMP) is provided specifying details relating to traffic management and as Appendix 14-2 this EIAR. Prior to the commencement of the construction phase of the proposed development a final Traffic Management Plan, incorporating all the mitigation measures set out in the TMP will be prepared by the Contractor for agreement with the local authority and An Garda Síochána. The TMP includes recommendations for the following</p> <ul style="list-style-type: none"> ➤ Traffic Management Coordinator – a competent Traffic Management Coordinator will be appointed for the duration of the project and this person will be the main point of contact for all matters relating to traffic management. ➤ Delivery Programme – a programme of deliveries will be submitted to the County Councils in advance of deliveries of turbine components to site. Liaison with the relevant local authorities and Transport Infrastructure Ireland (TII) will be carried out where required regarding requirements such as delivery timetabling. The

			<p>programme will ensure that deliveries are scheduled in order to minimise the demand on the local network and minimise the pressure on the access to the site.</p> <ul style="list-style-type: none"> ➤ Information to locals – Locals in the area will be informed of any upcoming traffic related matters e.g. temporary lane/road closures (where required) or delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Project Co-ordinator, who will be the main point of contact for all queries from the public or local authorities during normal working hours. An "out of hours" emergency number will also be provided. ➤ A Pre and Post Construction Condition Survey – Where required by the local authority, a pre-condition survey of roads associated with the proposed development can be carried out immediately prior to construction commencement to verify and record the condition of the road at the time. A post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. Where required the timing of these surveys will be agreed with the local authority. All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers. ➤ Liaison with the relevant local authority - Liaison with the County Councils and An Garda Síochána, will be carried out during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. Once the surveys have been carried out and “prior to commencement” status of the relevant roads established, (in compliance with the provisions of the CEMP), the Roads section will be informed of the relevant names and contact numbers for the Project Developer/Contractor Site Manager as well as the Site Environmental Manager. ➤ Implementation of temporary alterations to road network at critical junctions – at locations highlighted in section 14.1.8. In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable. ➤ Identification of delivery routes – These routes will be agreed with the County Councils and adhered to by all contractors.
--	--	--	--

			<ul style="list-style-type: none"> ➤ Delivery times of large turbine components - The management plan will include the option to deliver the large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage. ➤ Travel plan for construction workers – While the assessment above has assumed the worst case in that construction workers will drive to the site, the construction company will be required to provide a travel plan for construction staff, ➤ Additional measures - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on site and sweeping / cleaning of local roads as required. These are set out in the CEMP which is contained in Appendix 4.3. ➤ Re-instatement works - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.
MM13	Information to Local Residents	EIAR Chapter 14	Locals in the area will be informed of any upcoming traffic related matters e.g. temporary lane/road closures (where required) or delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Project Co-Ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided. The Coillte CLO, in place since June 2018 will also be liaising with all local residents and near neighbours.
Construction Phase			
<i>Construction Management</i>			
MM14	Health and Safety	EIAR Chapter 5	<p>During construction of the Proposed Development, all staff will be made aware of and adhere to:</p> <ul style="list-style-type: none"> ➤ Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005); ➤ Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007), as amended; ➤ Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. 291 of 2013), as amended; and

			<p>➤ Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006).</p> <p>This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan which will include measures to exclude members of the public from certain areas of the site during construction.</p>
MM15	Health and Safety	EIAR Chapter 4	<p>Stock-proof fencing will be erected around the borrow pit and peat and spoil repositories if deemed necessary to prevent uncontrolled access to this area. Appropriate health and safety signage will also be erected on this fencing and at locations around the site</p>
MM16	Health and Safety	EIAR Chapter 5	<p>The scale and scope of the project requires that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Health & Safety Authority’s ‘Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2006’.</p> <p>The PSDP appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to):</p> <ul style="list-style-type: none"> ➤ Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project; ➤ Where possible, eliminate the hazards or reduce the risks; ➤ Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan; ➤ Ensure that the work of designers is coordinated to ensure safety; ➤ Organise co-operation between designers; ➤ Prepare a written Safety and Health Plan; ➤ Prepare a safety file for the completed structure and give it to the client; and ➤ Notify the Authority and the client of non-compliance with any written directions issued.

MM17	Health and Safety	ELAR Chapter 5	<p>The PSCS appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to):</p> <ul style="list-style-type: none"> ➤ Development of the Safety and Health Plan for the construction stage with updating where required as work progresses; ➤ Compile and develop safety file information ➤ Reporting of accidents / incidents; ➤ Weekly site meeting with PSCS; ➤ Coordinate arrangements for checking the implementation of safe working procedures. Ensure that the following are being carried out: ➤ Induction of all site staff including any new staff enlisted for the project from time to time; ➤ Toolbox talks as necessary; ➤ Maintenance of a file which lists personnel on site, their name, nationality, current Safe Pass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date; ➤ Report on site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; ➤ Monitor the compliance of contractors and others and take corrective action where necessary; and ➤ Notify the Authority and the client of non-compliance with any written directions issued.
MM18	Refuelling,	ELAR Section 4, 6, 8, 9	<p>On-site refuelling will be carried out using a mobile double skinned, bunded fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site and will be towed around the site by a 4x4 jeep to where machinery is located. It is not practical for all vehicles to travel back to a single refuelling point, given the size of the cranes, excavators, etc. that will be used during the construction of the proposed wind farm development. The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction when not in use. Refuelling operations will be carried out only by designated trained and competent operatives under a Permit to Refuel process. Mobile anti-</p>

			pollution measures such as drip trays and fuel absorbent mats will be used during all refuelling operations
MM19	Reinstatement	EIAR Chapter 4	Some overburden material will be stored temporarily adjacent to the works areas for reinstatement when the main construction activities are completed. Soil will be backfilled outside the drainage channels along track-sides and vegetated sods replaced over the surface, bedded-in, regraded, etc., to re-constitute a stable and settled ground surface on which the natural vegetation can recover and will be resistant to erosion.
MM20	Plant and Equipment Inspections	EIAR Chapter 8.	A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the construction phase.
MM21	Environmental Management- Invasive Species	EIAR Chapter 6	<p>Best practice measures in relation to invasive species are described below:</p> <ul style="list-style-type: none"> ➤ All earthworks machinery will be thoroughly pressure-washed prior to arrival on site and prior to their further use elsewhere. ➤ Care will be taken not to disturb or cause the movement of invasive species fragments, either intentionally or accidentally. ➤ Stands of Knotweed will be clearly demarcated by temporary fencing and tracking within them will be strictly avoided. A minimum buffer of seven metres will be applied to avoid disturbance of lateral Knotweed rhizomes. ➤ Where works occur within 7m of a Knotweed stand these will be carried out under the supervision of a suitably qualified ecologist. ➤ Should removal of Knotweed off site be required this will be done so under the supervision of an ecologist in line with NPWS licencing. ➤ The machinery must be thoroughly cleaned down under supervision of an ecologist prior to moving away from the Knotweed contaminated area. ➤ All contractors and staff will be briefed about the presence, identification and significance of Knotweed before commencement of works. ➤ Good construction site hygiene will be employed to prevent the spread of these species with vehicles thoroughly cleaned down prior to leaving any site with the potential to have supported invasive species. All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) will be thoroughly cleaned

			<p>down on site to prevent the spread of invasive plant species such as Knotweed. All clean down must be undertaken in areas with no potential to result in the spread of invasive species.</p> <ul style="list-style-type: none"> ➤ When working at locations in proximity to natural watercourses, a suitable barrier will be erected between the watercourse and the stand of invasive species. This will assist in preventing the spread of any invasive species into the watercourse during their removal. ➤ Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the ‘Third Schedule’ of Regulations 49 & 50 of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). This will be carried out by searching for rhizomes and plant material. ➤ Any soils or subsoils contaminated with invasive species will be sent for disposal to an authorized waste facility under licence from NPWS. <p>The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority - The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA 2010) and Irish Water (2016) Information and Guidance Document on Japanese Knotweed.</p>
<i>Drainage Design and Management</i>			
MM22	Clear Felling of Coniferous Plantation	EIAR Chapter 9	<p>A self-imposed buffer zone of 50 metres will be maintained for all streams. The large distance between most of the proposed felling areas (which are outside the 50m buffer) and sensitive aquatic zones means that potential poor-quality runoff from felling areas will be adequately managed and attenuated prior to even reaching the aquatic buffer zone and primary drainage routes.</p> <p>The following mitigation measures will be employed during tree felling. Additional measures are indicated for felling inside the 50m buffer zone.</p> <p>Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods (from the guidance listed above) which are set out as follows:</p>

			<ul style="list-style-type: none"> ➤ Machine combinations (i.e. hand-held or mechanical) will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance; ➤ Trees will be cut manually inside the 50m buffer and using machinery to extract whole trees only; ➤ Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works; ➤ Ditches which drain from the proposed area to be felled towards existing surface watercourses will be blocked, and temporary silt traps will be constructed. No direct discharge of such ditches to watercourses will occur. Drains and sediment traps will be installed during ground preparation. Collector drains will be excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where there are steep gradients, and should avoid being placed at right angles to the contour; ➤ Sediment traps will be sited in drains downstream of felling areas. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of in the peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; ➤ In areas particularly sensitive to erosion or where felling inside the 50 metre buffer is required, it will be necessary to install double or triple sediment traps. ➤ Double silt fencing will also be put down slope of felling areas which are located inside the 50 metre buffer zone; ➤ All drainage channels will taper out before entering the aquatic buffer zone. This ensures that discharged water gently fans out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible soils, silt traps will be installed at the end of the drainage channels, to the outside of the buffer zone; ➤ Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded. Correct drain
--	--	--	---

			<p>alignment, spacing and depth will ensure that erosion and sediment build-up are minimized and controlled;</p> <ul style="list-style-type: none"> ➤ Brash mats will be used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal should take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction should be suspended during periods of high rainfall; ➤ Timber will be stacked in dry areas, and outside a local 50 metre watercourse buffer. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites; ➤ Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water run-off; ➤ Checking and maintenance of roads and culverts will be on-going through the felling operation; ➤ No crossing of streams by machinery will be permitted and only travel perpendicular to and away from stream will be allowed; ➤ Refuelling or maintenance of machinery will not occur within 100m of a watercourse. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; ➤ A permit to refuel system will be adopted at the site; and, ➤ Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors.
MM23	Silt Traps	EIAR Chapter 9	Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps and drain blocking is to slow water flow, increase residence time, and allow settling of silt in a controlled manner.
MM24	Drain Inspection and Maintenance	EIAR Chapter 9	The following items shall be carried out during pre-felling inspections and after:

			<ul style="list-style-type: none"> ➤ Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; ➤ Inspection of all areas reported as having unusual ground conditions; ➤ Inspection of main drainage ditches and outfalls. During pre-felling inspections, the main drainage ditches shall be identified. Ideally the pre-felling inspection shall be carried out during rainfall; ➤ Following tree felling all main drains shall be inspected to ensure that they are functioning; ➤ Extraction tracks nears drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; ➤ Culverts on drains exiting the site will be unblocked; and, ➤ All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall.
MM25	Surface Water Quality Monitoring	EIAR Chapter 9	<p>Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The ‘before’ sampling should be conducted within 4 weeks of the felling activity, preferably in medium to high water flow conditions. The “during” sampling will be undertaken once a week or after rainfall events. The ‘after’ sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown). The felling surface water monitoring data will also be compared with the EIAR baseline water quality sampling data.</p> <p>Criteria for the selection of water sampling points include the following:</p> <ul style="list-style-type: none"> ➤ Avoid man-made ditches and drains, or watercourses that do not have year-round flows, i.e. avoid ephemeral ditches, drains or watercourses; ➤ Select sampling points upstream and downstream of the forestry activities; ➤ It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry;

			<ul style="list-style-type: none"> ➤ Where possible, downstream locations should be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no impact through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and, ➤ The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed. ➤ Daily surface water monitoring forms will be utilised at every works site near watercourses. These will be taken daily and kept on site for record and inspection.
MM26	Earthworks	ELAR Chapter 9	<ul style="list-style-type: none"> ➤ Avoid working during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. ➤ Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the proposed wind farm drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion; ➤ Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; ➤ During the construction phase of the wind farm, runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through stilling ponds and buffered outfalls onto vegetated surfaces; ➤ Buffered outfalls which will be numerous over the site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the site; and, ➤ Drains running parallel to the existing roads that requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction

			works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters.
MM27	Check dams	EIAR Chapter 9	Check dams will not be used in any natural watercourses, only artificial drainage channels and interceptor drains. The check dams will be installed at regular intervals along interceptor drains to restrict flow velocity, minimise channel erosion and promote sedimentation behind the dam as per the drainage design.
MM28	Level Spreaders	EIAR Chapter 9	A level spreader will be constructed at the end of each interceptor drain to convert concentrated flows in the drain into diffuse sheet flow on areas of vegetated ground. The levels spreaders will be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the site.
MM29	Vegetation filters	EIAR Chapter 4	Vegetation filters, that is areas of existing vegetation, accepting drainage water issuing from level spreaders as sheet flow, will remove any suspended sediment from water channelled via interceptor drains or any remaining sediment in waters channelled via swales and settlement ponds.
MM30	Settlement ponds	EIAR Chapter 9	Settlement ponds, placed either singly or a pair in series, will buffer volumes of run-off discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to water courses as per the drainage design.
MM31	Silt Fences	EIAR Chapter 9	Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to water courses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the hydrological buffer zones.
MM32	Water Treatment Train	EIAR Chapter 9	A water treatment train such as a “Siltbuster” if required. If the discharge water from construction areas fails to be of a high quality during the daily inspections then a filtration treatment system (such

			as a ‘Siltbuster’ or similar equivalent treatment train (sequence of water treatment processes) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply for all of the construction phase.
MM33	Silt Bags	EIAR Chapter 9	Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, the majority of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats. Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.

MM34	Potential Release of Hydrocarbons	EIAR Chapter 9	<ul style="list-style-type: none"> ➤ All plant will be inspected and certified to ensure they are leak free and in good working order prior to use on site; ➤ On-site re-fuelling of machinery will be carried out using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer or truck will be re-filled off site and will be towed/driven around the site to where machinery are located. The 4x4 jeep/fuel truck will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site under a Permit to refuel process. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations; ➤ Fuels stored on site will be minimised. Any storage areas will be located within the temporary construction compounds and be bunded appropriately for the fuel storage volume for the time period of the construction; ➤ The electrical control building will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; ➤ An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan. Spill kits will be available to deal with accidental spillages.
MM35	Release of Cement-Based Products	EIAR Chapter 9	<ul style="list-style-type: none"> ➤ No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. ➤ the use of pre-cast elements for culverts and concrete works will be prioritised. ➤ Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined cement washout ponds. ➤ Weather forecasting will be used to plan dry days for pouring concrete.

			<ul style="list-style-type: none"> ➤ The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.
MM36	Morphological Changes to Surface Water Courses & Drainage Patterns	EIAR Chapter 9	<ul style="list-style-type: none"> ➤ All proposed new stream crossings will be bottomless culverts or clear span structures and the existing banks will remain undisturbed. No in-stream excavation works are proposed and therefore there will be no direct impact on the stream at the proposed crossing location; ➤ Where the proposed underground cabling route follows an existing road or road proposed for upgrade, the cable will pass over or below the culvert within the access road; ➤ Any guidance / mitigation measures required by the OPW or the Inland Fisheries Ireland during consultation/consenting process (such as Section 50 Applications as defined below) will be incorporated into the design of the proposed crossings; ➤ As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document “Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites”, i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI); ➤ During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and, ➤ All new river/stream crossings will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent.

MM37	Plant and equipment inspections	EIAR Chapter 8	Site plant will be regularly inspected for leaks and fitness for purpose; and, an emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan. Spill kits will be available to deal with accidental spillages.
MM38	Wastewater Disposal	EIAR Chapter 4	Temporary port-a-loo toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by an appropriately consented waste collector to wastewater treatment plants.
MM39	Concrete Deliveries and Management	EIAR Chapter 4	No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products will be used and where possible, pre-cast elements for culverts and concrete works will be used.
MM40	Concrete Deliveries and Management	EIAR Chapter 4	No washing out of any plant used in concrete transport or concreting operations will be allowed on-site.
MM41	Concrete Deliveries and Management	EIAR Chapter 4	Where concrete is delivered on site, only the chute need be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water is to be directed into a dedicated lined washout area. This lined area will be removed from site once the construction phase is complete.
MM42	Concrete Deliveries and Management	EIAR Chapter 4	Weather forecasting will be used to plan dry days for pouring concrete. Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event
MM43	Concrete Deliveries and Management	EIAR Chapter 4	The use of pre-cast elements for culverts and concrete works will be prioritised.

Peat, Subsoils and Bedrock			
MM44	Topsoil/Peat and Subsoil Excavation	EIAR Chapter 8	<ul style="list-style-type: none"> ➤ Placement of turbines and associated infrastructure in areas with shallow peat during the design phase; ➤ Use of the existing road network to reduce peat excavation and borrow pit volumes; ➤ Use of floating roads (where acceptable to do so) to reduce peat excavation volumes; ➤ The peat and subsoil which will be removed during the construction phase will be localised to the Proposed Development infrastructure; ➤ No turbines or related infrastructure will be constructed near or on any designated sites such as NHAs or SACs; ➤ A minimal volume of peat and subsoil will be removed to allow for infrastructural work to take place in comparison to the total volume present on the site due to optimisation of the layout by mitigation by design; ➤ The bedrock at the site is classified as “Medium” importance; and, ➤ The peat deposits and mineral soil at the site is classified as “Low” importance as the blanket bog is already degraded by forestry works and drainage.
MM45	Peat Instability and Failure	EIAR Chapter 8	<ul style="list-style-type: none"> ➤ Appointment of experienced and competent contractors; ➤ The site will be supervised by experienced and qualified personnel; ➤ Allocate sufficient time for the project (be aware that decreasing the construction time has the potential to increase the risk of initiating a peat movement); ➤ Prevent undercutting of slopes and unsupported excavations; ➤ Maintain a managed robust drainage system; ➤ Prevent placement of loads/overburden on marginal ground as detailed in the peat stability assessment report; ➤ Set up, maintain and report findings from monitoring systems; ➤ Ensure construction method statements are followed or where agreed modified/developed; and, ➤ Revise and amend the Geotechnical Risk Register as construction progresses.
MM46	Contamination of Soil by Leakages and Spillages and	EIAR Chapter 8	<ul style="list-style-type: none"> ➤ Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling will occur at a controlled fuelling station;

	Alteration of Peat/Soil Geochemistry		<ul style="list-style-type: none"> ➤ On site re-fuelling will be undertaken using a double skinned bowser with spill kits on the ready for accidental leakages or spillages; ➤ On site re-fuelling will be undertaken by suitably trained personnel only under a permit to refuel system; ➤ Fuels stored on site will be minimised. Storage areas located at the temporary compounds where required will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor; ➤ The electrical substation will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; ➤ The plant used during construction will be regularly inspected for leaks and fitness for purpose; ➤ All waste tar material arising from the chipping and resurfacing of the public road portion of the temporary construction access road will be removed off-site and taken to licenced waste facility; ➤ An emergency plan for the construction phase to deal with accidental spillages is contained within the Construction and Environmental Management Plan (Appendix 4-4 of this EIAR). Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.
MM47	Erosion of Exposed Subsoils and Peat During Construction of Infrastructure	EIAR Chapter 8	<ul style="list-style-type: none"> ➤ Peat removed from turbine locations and access roads will be used for landscaping, placed alongside designated access roads, used to reinstate the 1 no. proposed borrow pits or placed in 2 no. repositories. Where possible, the acrotelm shall be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the stored peat within the borrow pits. Re-seeding and spreading/planting of heather and moss cuttings will also be carried out in these areas. These measures will prevent erosion of stored peat in the long term. A full Peat and Spoil Management Plan for the development is included as Appendix 4-2. ➤ Any excess temporary mounded peat in storage for long periods will be sealed using the back of an excavator bucket. This will prevent erosion of soil. Silt fences

			<p>will be installed around stockpiles to limit movement of entrained sediment in surface water runoff. The use of bunds around earthworks and mounds will prevent egress of water from the works.</p> <ul style="list-style-type: none"> ➤ In order to minimize erosion of mineral subsoils stripping of peat will not take place during extremely wet periods as defined in the Chapter 9 of this EIAR (to prevent increased silt rich runoff). Temporary drainage systems will be required to limit runoff impacts during the construction phase. ➤ During tree felling, brash mats will be used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting.
Biodiversity			
MM48	Potential Effects on Rivers and Streams, Open Waterbodies and Sensitive Aquatic Faunal Species	EIAR Chapter and Chapter 9	<ul style="list-style-type: none"> ➤ A detailed drainage maintenance plan for the proposed development is provided in Section 4.7.11 of this EIAR. This plan provides details of how water quality will be protected during the construction of the proposed development. In addition to this, specific mitigation is provided in relation to water quality in Chapter 9 of this EIAR. In addition, the Construction Environmental Management Plan (CEMP) that is provided as Appendix 4-4 of the EIAR, provides the details of exactly how the measures will be implemented during construction. ➤ In relation to watercourse crossings, Inland Fisheries Ireland (IFI) will be consulted a minimum of four weeks in advance of the installation of clear-span bridges .
MM49	Potential Effects on Peatlands and Associated Habitats	EIAR Chapter 6	<ul style="list-style-type: none"> ➤ The proposed development has been deliberately designed to minimise loss of Upland blanket bog (PB2). Where the development footprint does occur on this habitat at Turbine 1, the proposed development provides for the replacement of peatland habitat through the restoration of forestry (WD4) back to peatland, located adjacent to Turbine 7. This is fully described in the site-specific Biodiversity Management Plan (BMP), provided in Appendix 6-5 of the EIAR. The BMP aims to ensure that there will be no net loss of peatland habitat

			associated with the proposed development. This has been further developed by the inclusion of an additional peatland enhancement area comprising of degraded Upland blanket bog (PB2) located to the north of Turbine 7. It is proposed to undertake enhancement of this area of peatland through drain blocking and the removal of encroaching conifers (establishing as a result of natural seed dispersal). The location and extent of the habitat replacement and enhancement areas located adjacent to T7 are mapped in the Biodiversity Management Plan, Appendix 6-5 of the EIAR
MM50	Fauna	EIAR Chapter 6	<ul style="list-style-type: none"> ➤ An exclusion zone will be put in place along the section of haul road during the construction phase to ensure works are not undertaken within 30 metres of a known badger sett on site (known to be approx. 40 metres from the proposed footprint). ➤ No works should be undertaken within 150m of any holts at which breeding females or cubs are present. ➤ No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence (TII, 20061). ➤ All of the above works will be undertaken or supervised by an appropriately qualified ecologist.
MM51	Bats	EIAR Chapter 6	<ul style="list-style-type: none"> ➤ Construction best practice will be employed to minimise general noise and disturbance potential. Plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).
MM52	Invasive Species	EIAR Chapter 6	<ul style="list-style-type: none"> ➤ All earthworks machinery will be thoroughly pressure-washed prior to arrival on site and prior to their further use elsewhere.

¹ NRA, 2006. *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes*. Dublin: Transport Infrastructure Ireland. Available at: www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf

			<ul style="list-style-type: none"> ➤ Care will be taken not to disturb or cause the movement of invasive species fragments, either intentionally or accidentally. ➤ Stands of Knotweed will be clearly demarcated by temporary fencing and tracking within them will be strictly avoided. A minimum buffer of seven metres will be applied to avoid disturbance of lateral Knotweed rhizomes. ➤ Where works occur within 7m of a Knotweed stand these will be carried out under the supervision of a suitably qualified ecologist. ➤ Should removal of Knotweed off site be required this will be done so under the supervision of an ecologist in line with NPWS licencing. ➤ The machinery must be thoroughly cleaned down under supervision of an ecologist prior to moving away from the Knotweed contaminated area. ➤ All contractors and staff will be briefed about the presence, identification and significance of Knotweed before commencement of works. ➤ Good construction site hygiene will be employed to prevent the spread of these species with vehicles thoroughly cleaned down prior to leaving any site with the potential to have supported invasive species. All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) will be thoroughly cleaned down on site to prevent the spread of invasive plant species such as Knotweed. All clean down must be undertaken in areas with no potential to result in the spread of invasive species. ➤ When working at locations in proximity to natural watercourses, a suitable barrier will be erected between the watercourse and the stand of invasive species. This will assist in preventing the spread of any invasive species into the watercourse during their removal. ➤ Any material that is imported onto any site will be verified by a suitably qualified ecologist to be free from any invasive species listed on the ‘Third Schedule’ of Regulations 49 & 50 of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). This will be carried out by searching for rhizomes and plant material. ➤ Any soils or subsoils contaminated with invasive species will sent for disposal to an authorized waste facility under licence from NPWS. ➤ The treatment and control of invasive alien species will follow guidelines issued by the National Roads Authority - <i>The Management of Noxious Weeds and Non-</i>
--	--	--	--

			<i>native Invasive Plant Species on National Roads (NRA 2010) and Irish Water (2016) Information and Guidance Document on Japanese Knotweed.</i>
Ornithology			
MM53	Ornithology	EIAR Chapter 7	Taking a precautionary approach, it is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Pre-commencement surveys will be undertaken prior to the initiation of works at the wind farm.
MM54	Ornithology	EIAR Chapter 7	<ul style="list-style-type: none"> ➤ Following from the pre-commencement surveys, if a nest site of a high conservation species is found to be active during the construction phase no works shall be undertaken within a 500m buffer (Forestry Commission Scotland 2006; Ruddock & Whitfield 2007) in line with best practise. No works shall be permitted within the buffer until it can be demonstrated that the nest is no longer occupied. ➤ The removal of woody vegetation will be undertaken in accordance with Section 40 of the Wildlife Act 1976 as amended. ➤ During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. ➤ Plant and machinery will be turned off when not in use. ➤ All plant and equipment for use will comply with the Construction Plant and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations 2001 (S.I. No. 632 of 2001) other relevant legislation. ➤ An Ecological Clerk of Works (ECoW) will be appointed and will operate for the duration of construction works. Duties will include: <ul style="list-style-type: none"> ○ Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided. ○ Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Proposed Development site. ○ Oversee management of ornithological and ecological issues during the construction period and advise on ornithological issues as they arise. ○ Provide guidance to contractors to ensure legal compliance with respect to protected species onsite.

			<ul style="list-style-type: none"> ○ Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.
Noise & Vibration			
MM55	BS 5228-1:2009+A1:2014 <i>Code of practice for noise and vibration control on construction and open sites – Noise</i>	EIAR Chapter 5 and Chapter 11	<p>The proposed development is predicted to comply with the identified criteria for the construction phase. While no specific mitigation measures are required to achieve construction noise criteria, best practice mitigation measures below will be complied with.</p> <ul style="list-style-type: none"> ➤ limiting the hours during which site activities likely to create high levels of noise or vibration are permitted; ➤ establishing channels of communication between the contractor/developer, Local Authorities and residents; ➤ appointing a site representative responsible for matters relating to noise and vibration; ➤ monitoring typical levels of noise and vibration during critical periods and at sensitive locations; keeping site access roads even to mitigate the potential for vibration from lorries; ➤ selection of plant with low inherent potential for generation of noise and/or vibration; ➤ placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints, and; ➤ regular maintenance and servicing of plant items. ➤ No plant used on site will be permitted to cause an on-going public nuisance due to noise. ➤ The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. ➤ All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. ➤ Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. ➤ Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.

			<ul style="list-style-type: none"> ➤ Any plant, such as generators or pumps, which is required to operate outside of general construction hours will be surrounded by an acoustic enclosure or portable screen. ➤ During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Section 11.3.2.1.1 . using methods outlined in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise. ➤ The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs weekdays and between 7:00hrs and 14:00hrs on Saturdays. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours, rotor/tower deliveries) it will be necessary on occasion to work outside of these hours.
MM56	<i>BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration</i>	EIAR Chapter 5 and Chapter 11	<p>Specific to blasting the following mitigation measures will be employed to control the impact during blasts</p> <ul style="list-style-type: none"> ➤ Trial blasts may be undertaken to obtain scaled distance analysis; ➤ Ensuring appropriate burden to avoid over or under confinement of the charge; ➤ Accurate setting out and drilling; ➤ Appropriate charging; ➤ Appropriate stemming with appropriate material such as sized gravel or stone chipping; ➤ Delay detonation to ensure small maximum instantaneous charges; ➤ Decked charges and in-hole delays; ➤ Blast monitoring to enable adjustment of subsequent charges; ➤ Good blast design to maximise efficiency and reduce vibration; ➤ Avoid using exposed detonating cord on the surface.
MM57	<i>BS 5228-1:2009+A1:2014 Code of practice for noise and vibration</i>	EIAR Chapter 5	<p>Where rock breaking is employed in relation to the proposed borrow pit location, the following are examples of measures that will be employed, where necessary, to mitigate noise emissions from these activities:</p>

	<i>control on construction and open sites – Noise; Vibration</i>		<ul style="list-style-type: none"> ➤ Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency. ➤ Ensure all leaks in air lines are sealed. ➤ Use a dampened bit to eliminate ringing. ➤ Erect acoustic screen between compressor or generator and noise sensitive area. When possible, line of sight between top of machine and reception point needs to be obscured. ➤ Enclose breaker or rock drill in portable or fixed acoustic enclosure with suitable ventilation.
MM58	<i>BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise; Vibration</i>	EIAR Chapter 5 and Chapter 11	<p>Where blasting is employed in relation to the proposed borrow pit location, the following are examples of measures that will be employed, where necessary, to mitigate noise emissions from these activities:</p> <ul style="list-style-type: none"> ➤ Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs). ➤ Notification to nearby residents before blasting starts (e.g. 24-hour written notification). ➤ The firing of blasts at similar times to reduce the ‘startle’ effect. ➤ On-going circulars informing people of the progress of the works. ➤ The implementation of an onsite documented complaints procedure. ➤ The use of independent monitoring by external bodies for verification of results. ➤ Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence.
<i>Air Quality/Dust</i>			
MM59	Dust Emissions	EIAR Chapter10	<ul style="list-style-type: none"> ➤ In periods of extended dry weather, dust suppression may be necessary along haul roads, site roads, substation and construction compounds and around the borrow pit area to ensure dust does not cause a nuisance. If necessary, water will be taken from stilling ponds in the site’s drainage system, and will be pumped into a bowser or water spreader to dampen down haul roads, borrow pit and site compounds to prevent the generation of dust where required. Water bowser

			<p>movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff.</p> <ul style="list-style-type: none"> ➤ All plant and materials vehicles shall be stored in dedicated areas (on site). ➤ Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. ➤ Turbines and construction materials will be transported to the site on specified haul routes only. ➤ The agreed haul route roads adjacent to the site will be regularly inspected for cleanliness and cleaned as necessary. ➤ The transport of construction materials which may have the potential to generate dust will be undertaken with tarpaulin cover or similar, where necessary. ➤ The transport of dry excavated material from the on-site borrow pit which may have potential to generate dust will be avoided. If necessary, excavated material will be dampened prior to transport from the borrow pits.
MM60	Exhaust Emissions	EIAR Chapter 10	<ul style="list-style-type: none"> ➤ All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. ➤ All machinery will be switched off when not in use. ➤ The majority of aggregate materials for the construction of the proposed development will be obtained from the borrow pit on site. This will significantly reduce the number of delivery vehicles accessing the site, thereby reducing the amount of emissions associated with vehicle movements.
MM61	Greenhouse Gas Emissions	EIAR Chapter 10	<ul style="list-style-type: none"> ➤ All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. ➤ Turbines and construction materials will be transported to the site on specified routes only unless otherwise agreed with the Planning Authority. ➤ Aggregate materials for the construction of site access tracks and all associated infrastructure will all be locally sourced, where possible, which will further reduce potential emissions.

Traffic			
MM62	Traffic Management Co-Ordinator	EIAR Chapter 14	A competent Traffic Management Coordinator will be appointed for the duration of the project and this person will be the main point of contact for all matters relating to traffic management.
MM63	Liaison with the relevant local authority	EIAR Chapter 14	Liaison with the relevant local authority including the roads section of local authorities that the delivery routes traverse and An Garda Síochána, during the delivery phase.
MM64	Travel Plans for Construction Workers	EIAR Chapter 14	The construction company will be required to provide a travel plan for construction staff, which will include the identification of a routes to / from the site and identification of an area for parking.
MM65	Temporary traffic signs	EIAR Chapter 14	As part of the traffic management measures temporary traffic signs will be put in place at all key junctions, including the access junction on the N15. All measures will be in accordance with the “Traffic Signs Manual, Chapter 8 – Temporary Traffic Measures and Signs for Road Works” (DoT now DoTT&S) and “Guidance for the Control and Management of Traffic at Roadworks” (DoTT&S). A member of construction staff (flagman) will be present at key junctions during peak delivery times.
MM66	Delivery of abnormal sized loads	EIAR Chapter 14	<p>The following are the main points to note for these deliveries which will take place after peak evening traffic:</p> <ul style="list-style-type: none"> ➤ The delivery of turbine components is a specialist transport operation with the transportation of components carried out at night when traffic is at its lightest and the impact minimised. ➤ The deliveries will be made in consultation with the Local Authority and An Garda Síochána. ➤ It is estimated that 90 abnormal sized loads will be delivered to the site, comprising 18 convoys of 5, undertaken over 18 separate nights. ➤ These nights will be spread out over an approximate period of 9 weeks and will be agreed in advance with the relevant authorities ➤ In order to manage each of the travelling convoys, for each convoy there will be two Garda escort vehicles that will stop traffic at the front and rear of the convoy of 5 vehicles.

			<ul style="list-style-type: none"> ➤ There will also be two escort vehicles provided by the haulage company for each convoy ➤ Implementation of temporary alterations to road network at critical junctions – at locations highlighted in section 14.1.8. ➤ In addition, in order to minimise the impact on the existing environment during turbine component deliveries the option of blade adaptor trailers will also be used where deemed practicable.
MM67	Telecommunications	EIAR Chapter 14	The Department of Defense and Irish Aviation Authority (IAA) set out lighting requirements for turbines. These requirements will be complied with and form part of the proposed development. The coordinates and elevations for built turbines will be supplied to the IAA, as is standard practice for wind farm developments.
<i>Cultural Heritage</i>			
MM68	Impact of excavation works on unrecorded potential sub-surface sites	EIAR Chapter 13	<ul style="list-style-type: none"> ➤ Archaeological monitoring (under licence from the National Monuments Service) of any further geotechnical / engineering trial pits or investigations and a report detailing the results of same. ➤ Archaeological monitoring of ground works during construction works. The National Monuments Service will be informed of such findings to discuss how best to proceed. If archaeological finds, features or deposits are uncovered during archaeological monitoring, the developer will be prepared to provide resources for the resolution of such features whether by preservation by record (excavation) or preservation in situ (avoidance). Once the project is completed, a report on the results of the monitoring will be compiled and submitted to the relevant authorities. ➤ Preservation of Townland boundaries by record where relevant during construction stage monitoring at the following areas: <ul style="list-style-type: none"> ○ Proposed new road to T1 where it traverses the Garvagh/Garvagh-Glebe townland boundary

			<ul style="list-style-type: none"> ○ Proposed New road to T3 where it traverses the Garvagh-Glebe/ Carrownyclowan townland boundary ➤ A licensed metal detection survey of the watercourses that are proposed to be crossed. The metal detection survey will be undertaken concurrently during the construction stage in advance of any works to the rivers/streams. A report on the results should be submitted to the relevant authorities. ➤ Archaeological monitoring of any geotechnical / engineering trial pits or investigations and a report detailing the results of same. ➤ Archaeological monitoring of any geotechnical / engineering trial pits or investigations along the off-road sections of the proposed construction access road and a report detailing the results of same. ➤ Archaeological monitoring of topsoil/peat removal of all off-road sections of the proposed route during construction. A report on the results of the monitoring shall be compiled and submitted to the relevant authorities on completion of the project.
MM69	Felling Licence	EIAR Chapter 4	<ul style="list-style-type: none"> ➤ Felling will be carried out under the terms of a licence application to the Forest Service, as per the Forest Service’s policy on granting felling licenses for wind farm developments
MM70	Clear felling of Coniferous Plantation	EIAR Chapter 4	<ul style="list-style-type: none"> ➤ Works will be overseen by an ECoW as described above. ➤ The extent of all necessary tree felling will be identified and demarcated with markings on the ground in advance of any felling commencing. ➤ All roads and culverts will be inspected prior to any machinery being brought on site to commence the felling operation. No tracking of vehicles through watercourses will occur. Vehicles will only use existing road infrastructure and established watercourse crossings. ➤ Existing drains that drain an area to be felled towards surface watercourses will be blocked, and temporary silt traps will be constructed to ensure collection of all silt within felling areas. These temporary silt traps will be cleaned out and backfilled

			<p>once felling works are complete. This ensures there is no residual collected silt remaining in blocked drains after felling works are completed. No direct discharge of such drains to watercourses will occur from within felling areas.</p> <ul style="list-style-type: none"> ➤ New collector drains and sediment traps will be installed during ground preparation to intercept water upgradient of felling areas and divert it away. Collector drains will be excavated at an acute angle to the contour (0.3%-3% gradient), to minimise flow velocities. ➤ All silt traps will be sited outside of buffer zones and have no direct outflow into the aquatic zone. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of away from all aquatic zones. ➤ All new collector drains will taper out before entering the aquatic buffer zone to ensures the discharging water gently fans out over the buffer zone before entering the aquatic zone. ➤ Machine combinations will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance; ➤ Mechanised operations will be suspended during and immediately after heavy rainfall. ➤ Where brash is required to form brash mats, it is to be laid out at harvesting stage to prevent soil disturbance by machine movement. ➤ Unused Brash may be moved within the site to facilitate the creation of mats in more demanding locations. ➤ Felling of trees will be pointed directionally away from watercourses. ➤ Felling will be planned to minimise the number of machine passes in any one area. ➤ Extraction routes, and hence brash mats, will be aligned parallel to the ground contours where possible. ➤ Harvested timber will be stacked in dry areas, and outside any 50-metre watercourse buffer zone. Straw bales and check dams to be emplaced on the down gradient side of timber storage sites. ➤ Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed but removing of natural debris deflectors will be avoided
--	--	--	--

Operational Phase			
Health and Safety			
MM71	Health & Safety	EIAR Chapter 5	<p>Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits.</p> <p>Signs will be erected at suitable locations such as, amenity access points and carparks, setting out the conditions of public access under the relevant legislation and providing normal hours (and out of hours) contact details. Staff associated with the project will conduct frequent visits, which will include inspections to establish whether any signs have been defaced, removed or are becoming hidden by vegetation or foliage, with prompt action taken as necessary.</p> <p>Signs will also be erected at suitable locations across the site as required for the ease and safety of operation of the wind farm. These signs include:</p> <ul style="list-style-type: none"> ➤ Buried cable route markers at 30m (maximum) intervals and change of cable route direction; ➤ Directions to relevant turbines at junctions; ➤ “No access to Unauthorised Personnel” at appropriate locations; ➤ Speed limits signs at site entrance and junctions; ➤ “Warning these Premises are alarmed” at appropriate locations; ➤ “Danger HV” at appropriate locations; ➤ “Warning – Keep clear of structures during electrical storms, high winds or ice conditions” at site entrance; ➤ “No unauthorised vehicles beyond this point” at specific site entrances; and ➤ Other operational signage required as per site-specific hazards.
MM72	Health & Safety	EIAR Chapter 5	<p>An operational phase Health and Safety Plan will be developed to fully address identified Health and Safety issues associated with the operation of the site and providing for access for emergency services at all times.</p>

			<p>The components of a wind turbine are designed to last up to 30 years and are equipped with a number of safety devices to ensure safe operation during their lifetime. During the operation of the wind farm regular maintenance of the turbines will be carried out by the turbine manufacturer or appointed service company. A project or task specific Health and Safety Plan will be developed for these works in accordance with the site’s health and safety requirements.</p>
Biodiversity			
MM73	Bats	EIAR Chapter 6	<p>In order to reduce the value of the habitat for bat species in the areas surrounding the turbines, a buffer of at least 50m between the tip of the blade and any trees or other tall vegetation that could provide high quality foraging habitat for bat species will be implemented. Details of this mitigation and how it is calculated is provided in Appendix 6-2.</p> <p>In addition to this, ongoing monitoring of bat activity will be undertaken for at least 3 years’ post construction of the wind farm. This will provide data and information on the actual recorded impact of the wind turbines on the local bat populations. Full details of the proposed monitoring programme are provided in Appendix 6.2 and include measurement of bat activity, weather conditions and any correlation between the two. The monitoring will also include corpse searching in the areas surrounding the turbines to gather data on any actual collisions.</p> <p>If, following monitoring, there are significant effects recorded, a range of measures are proposed to ensure that any such effects are fully mitigated. These measures include blade feathering, curtailment of turbines during certain conditions and increase of buffers surrounding the turbines. Any or all of the above measures may be employed following actual monitoring of the impact of the operating turbines on bats to ensure that no potential for significant effects on bat species remains.</p>
Traffic Management			
MM74	Roads	EIAR Chapter 14	<p>A Post Construction Condition Survey – Where required by the local authority, a post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. Where required the timing of these surveys will be agreed with the local authority. All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers</p>

Population and Human Health			
MM75	Shadow Flicker	EIAR Chapter 5	<p>Where daily or annual shadow flicker exceedances are experienced at buildings, a site visit will be undertaken to determine the level of occurrence, existing screening and window orientation. The shadow flicker prediction data will be used to select dates on which a shadow flicker event could be observed at one or multiple affected properties and the following process will be adhered to.</p> <ol style="list-style-type: none"> 1. <i>Recording the weather conditions at the time of the site visit, including wind speeds and direction (i.e. blue sky, intermittent clouds, overcast, moderate breeze, light breeze, still etc.).</i> 2. <i>Recording the house number, time and duration of site visit and the observation point GPS coordinates.</i> 3. <i>Recording the nature of the sensitive receptor, its orientation, windows, landscaping in the vicinity, any elements of the built environment in the vicinity, vegetation.</i> 4. <i>In the event of shadow flicker being noted as occurring the details of the duration (times) of the occurrence will be recorded.</i> <p>In the event of an occurrence of shadow flicker exceeding guideline threshold values of 30 minutes per day at residential receptor locations, mitigation options will be discussed with the affected homeowner, including:</p> <ol style="list-style-type: none"> 1. <i>Installation of appropriate window blinds in the affected rooms of the residence;</i> 2. <i>Planting of screening vegetation;</i> 3. <i>Other site-specific measures which might be agreeable to the affected party and may lead to the desired mitigation.</i> <p>If it is not possible to mitigate any identified shadow flicker limit exceedance locally using the measures detailed above, wind turbine will be fitted with shadow flicker control units to allow the turbines to be controlled to prevent the occurrence of shadow flicker at properties surrounding the wind farm.</p>

Ornithology			
MM76	Bird monitoring programmes	EIAR Chapter 7	<p>A detailed post-construction Bird Monitoring Programme has been prepared for the operational phase of the Proposed Development, please refer to Appendix 7-7 for further details. The programme of works will monitor parameters associated with collision, displacement/barrier effects and habituation and these surveys will be scheduled to coincide with Years 1, 2, 3, 5, 10 & 15 of the life-time of the wind farm. Monitoring measures are broadly based on guidelines issued by the Scottish Natural Heritage (SNH, 2009). The following individual components are proposed for monitoring years:</p> <ul style="list-style-type: none"> ➤ Monthly flight activity surveys: vantage point surveys ➤ Distribution and abundance surveys: breeding wader to a 500m radius of the development area, breeding hen harrier surveys and winter hen harrier roost surveys to a 2km radius of the development area. ➤ Targeted bird collision surveys (corpse searches) will be undertaken with training dogs. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust.
Drainage Management Plan			
MM77	Progressive Replacement of Natural Surface with Lower Permeability Surfaces	EIAR Chapter 9	<ul style="list-style-type: none"> ➤ Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader; ➤ Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; ➤ On steep sections of access road transverse drains ('grips') will be constructed in the surface layer of the road to divert any runoff off the road into swales/road side drains; ➤ Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock;

			<ul style="list-style-type: none"> ➤ Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, ➤ Settlement ponds will be designed in consideration of the greenfield runoff rate.
Noise & Vibration			
MM78	Turbine Programming	EIAR Chapter 11	<ul style="list-style-type: none"> ➤ The predicted operational noise levels of the proposed development will be within the relevant best practice noise criteria curves for wind farms at all but one noise sensitive location. Therefore, on a very limited basis, curtailment of turbine operation in certain wind speeds and directions will be required to achieve the noise criteria. Modern wind turbines can be programmed to run in reduced modes of operation (or low noise modes) in order to achieve the calculated attenuation required in the specific wind conditions (i.e. wind speed and direction). Operating the turbines in reduced noise modes is generally referred to as curtailment. ➤ Low Frequency Noise: In the unlikely event of low frequency noise, a detailed investigation will be undertaken following guidance outlined in Appendix VI of the EPA document entitled Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (EPA, 2016). ➤ Amplitude Modulation (AM): In the unlikely event of AM, an independent Acoustic Consultant will assess the level of AM in accordance with the methods outlined in the Institute of Acoustics (IoA) Noise working Group (Wind Turbine Noise) Amplitude Modulation Working Group (AMWG) namely, A Method for Rating Amplitude Modulation in Wind Turbine Noise (August 2016) or subsequent revisions (August 2016).
MM79	Noise Monitoring	EIAR Chapter 11	<p>Commissioning noise surveys will be undertaken to ensure compliance with any noise conditions applied to the development. In the unlikely instance that an exceedance of these noise criteria is identified, the assessment guidance outlined in the IoA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014) should be followed and relevant corrective actions will be taken. For example, implementation of noise operational modes resulting in curtailment of</p>

			<p>turbine operation can be implemented for specific turbines in specific wind conditions to ensure predicted noise levels are within the relevant noise criterion curves/planning conditions. Such curtailment can be applied using the wind farm SCADA system without undue effect on the wind farm operations.</p> <p>For post-commissioning of the proposed turbine units, the noise monitoring be repeated with consideration of the guidance outlined in the IoA GPG and Supplementary Guidance Note 5.</p>
Decommissioning Phase			
MM80	Ornithology	EIAR Chapter 7	<p>The following measures are proposed for the decommissioning phase:</p> <ul style="list-style-type: none"> ➤ During the decommissioning phase, disturbance limitation measures will be as per the construction phase, e.g. commencing works outside the bird nesting season (1st of March to 31st of August inclusive). ➤ Plant machinery will be turned off when not in use. ➤ All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).